

REMARKS

By the present Amendment, the specification and claims 16 and 24 are amended. This leaves claims 11-25 pending in the application, with claims 11 and 19 being independent.

Since these amendments address objections raised for the first time in the final rejection and do not raise new issues requiring further search or consideration, such amendments should be entered at this time to place the application in condition for allowance or in better form for appeal.

Objection Under 35 U.S.C. §132(a)

The specification is objected to under 35 U.S.C. §132(a) as allegedly containing new matter in referring to an “automatic clutch” on page 7, lines 19-20, of the substitute specification. Allegedly, “automatic clutch” is a narrower term than the originally recited “free wheeling device”.

However, as used in this application, the reference of “automatic clutch” is merely used as an alternative description of the structure identified by reference number 56 in the specification, and thus, does not constitute matter. Nothing in the record supports the conclusionary allegation that “automatic clutch” is a narrower term. Exhibit A supports this alternative description and provides evidence that this addition to the specification is adequately supported since one skilled in the art would recognize these terms as being alternatives in the context of this application.

The use of “automatic clutch” also constitutes a proper exercise of an applicant’s right to be his/her own lexicographer pursuant to M.P.E.P. §2173.01.

Reconsideration and withdrawal of this objection is requested.

Rejections Under 35 U.S.C. §112, Second Paragraph

Claims 11-18 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Relative to claim 11, the reference to “output part” appears to be questioned. Such part refers to the driven part 54 described in the original and substitute specifications. This objection is avoided by adding “output part” to page 7 of the substitute specification.

Relative to claims 16 and 24 (not claim 22), the reference to “bar” appearing to be the basis for the rejection of these claims is avoided by deleting this term from these claims and by reciting “a tubular screen filter element” to match more closely the terminology in the descriptive portions of the original and substitute specifications.

Thus, the pending claims are formal and comply with 35 U.S.C. § 112.

Rejections Under 35 U.S.C. §103

New independent claim 11 covers a filter device comprising a filter housing 10 with an unfiltered fluid inlet 20, a filtered fluid outlet 22 and a backwash fluid outlet 26. Filter elements 28 are in the housing receiving fluid flow in one direction for filtration and in an opposite direction for backwashing effective filter surfaces. A pivoting device 30 mounts the filter elements in the filter housing for sequential rotational movement about a pivot axis between filtration positions in which unfiltered fluid flows from the inside to outside through the filter elements and a backwashing position in which filtered fluid flows from the outside to inside through the filter elements. The pivot device has a rotatably mounted receiving part 32 mounting the fluid elements parallel to the pivot axis along a path coaxial to the pivot axis and has first and second end parts 40, 38. The filter elements extend between the end parts. The first end part 40 faces toward the fluid inlet and is rotatably guided along inside of the filter housing by a seal 42.

A drive 34 is coupled to receiving part 32 to rotate the receiving part, includes a rod-shaped drive part 52 releasably connecting the first and second end parts and includes a pneumatic motor 34 producing alternating to and fro movements on an output part convertible into a constant drive movement in a drive direction of the drive part by a free wheel device 56.

By forming the filter device in this manner, the filter device can be more effectively sealed, can operate more efficiently, particularly for backwashing and requires only a relatively small installation space. These advantages are particularly enhanced by the flow through the filter for filtration being from the inside out and for the backwashing flow being from the outside in such that the pressure of the filtered fluid can be used as the backwashing fluid and such that no additional backwashing fluid need be supplied.

Claims 11, 12, 14, 15, 17, and 18 stand rejected under 35 U.S.C. §103 as being unpatentable over EP Publication No. 09/00548 to Sindorf. The Sindorf publication is alleged to have all of the structure recited in claim 11, except for the reverse flow through the filter device which reverse flow is alleged to be obvious.

However, nothing supports this contention of obviousness. Particularly, the claimed structure provides the reverse flow allowing use of the filtered fluid for the backwashing fluid rather than a separate fluid as in the Sindorf device so that more than a mere reversal of parts is involved in the proposed modification. Thus, this reversal is not obvious, as alleged, and involves structural differences (particularly the backwash position with the filter elements necessarily exposed to the filtered fluid in the housing for the recited flow), rather than a mere difference in the apparatus contents during operation.

Additionally, claim 11 requires a drive part releasably connecting the end parts of the pivoting device. Relative to this separable or releasable connection, the statement of the Examiner refers to separable connection between the Sindorf filter housing 1 and its base section 2. However, that releasable connection is not part of a drive part connecting the ends of a pivoting device as claimed.

Specifically, the Sindorf patent discloses an arrangement in which filtration of the fluid to be filtered entering through inlet 5 passes through the filter elements 12 from the outside to the inside, as shown by the right-hand filter in Fig. 1 and the three right most filter elements in Fig. 4. The filtered fluid then passes through the interior of the filter element, and is conveyed out outlet 6. The filter element shown in the left-hand side of Figs. 1 and 4 is being backwashed by compressed air being forced upwardly through the interior of the filter element causing the debris on the outside of the filter to be discharged through passage opening 25 and out mud drain valve 34, 37. A pneumatic motor formed by a rotary drive 4 is coupled to a clutch plate 13 with kant set 16 and clutch opening 15 with the drive also including a bearing ring 14.

The Sindorf drive arrangement does not rotate a receiving part holding the filter element where the drive includes a rod-shaped drive part releasably connecting the first and second end parts and with a free wheel device. The longitudinal axis 10 referenced is not part of the Sindorf drive and does not provide a releasable connection.

Moreover, as noted above, the filtering and backwash flow through the Sindorf filter elements 12, as indicated by the Sindorf structure, is opposite to that provided by the claimed structure, and a separate fluid (compressed air) is used for backwashing, not filtered fluid from the filter elements, as provided by the claimed structure.

Claim 11 is also distinguished by the first end part facing the inlet and rotatably guided from the inside surface of the filter housing by a seal. The Sindorf header 3 and footer 2, alleged to correspond to the claimed end parts, do not have one thereof (particularly bearing surface 20) facing its unfiltered fluid inlet 5 and do not have the filter element extending between them. No such arrangement is disclosed or rendered obvious by the Sindorf patent.

Thus, the subject matter of claim 11 is not anticipated or rendered obvious by the Sindorf patent. None of the other cited patents cure these deficiencies in the Sindorf patent.

Independent claim 19 covers a filter device comprising a filter housing 10 having an unfiltered fluid inlet 20, a filtered outlet 22 and a backwash filter outlet 26. Filter elements 18 are in the filter housing receiving fluid flow in one direction for filtration and in an opposite direction for backwashing effective filter surfaces. A pivoting device 30 mounts the filter elements in the filter housing for sequential rotational movement about a pivot axis between filtration positions in which unfiltered fluid flows from inside to outside through the filter elements and a backwashing position in which the filtered fluid flows from outside to inside through the filter elements. The pivot axis has a rotatably mounted receiving part 32 mounting the filter elements parallel to the filter axis along a path coaxial to the pivot axis and having first and second end parts 40, 38. The filter elements extend between the end parts. The first end part 40 faces toward the fluid inlet and is rotatably guided along an inside of the filter having the seal 42. A drive 34 is coupled to the receiving part to rotate the receiving part. A lower part of the filter housing has an arcuate-shaped recess over which several of the filter elements can be located simultaneously in the filter position with their lower open cross sections in fluid communication with that arcuate-shaped recess, and has a backwash recess over with the filter

elements are sequentially located in the backwashing position with the free open cross sections in fluid communication with it. The arcuate-shaped recess is in fluid communication with the fluid inlet. The backwash recess is in fluid communication with the backwash fluid outlet.

In addition to certain advantages discussed above relative to claim 11, claim 19 is further distinguishable by the Sindorf patent by the claimed arcuate-shaped recess by which the fluid inlet is in fluid communication with the inside of the filter elements in the filtration positions simultaneously. In contrast, no arcuate-shaped recess is provided in the Sindorf system in which, as best illustrated in Fig. 4, the inlet 5 passes fluid from the lateral and outside surfaces of the filter elements 11. The Sindorf openings 18 in plate 17 consist “of threaded bores on a common reference circle” (page 9, paragraph 0014, line 3 of USPTO translation), and thus, are not arcuate. Also, Sindorf openings 18 communicate with outlet 6, not inlet 5, contrary to the claimed structure.

Claims 12-18 and 20-25, being dependent upon claims 11 and 19, respectively, are also allowable for the above reasons. Moreover, these dependent claims recite additional features further distinguishing them over the cited patents.

Claims 12 and 20 are further distinguishable by the free wheel device having a free wheel sleeve delivering power in one direction up to a set torque and not applying drive torque in an opposite direction. Such arrangement is not shown to be disclosed or rendered obvious by the Sindorf patent. No evidence of the alleged “known technique...to improve similar devices...” is provided. Such unsupported allegations of obviousness are improper.

Claims 13 and 21 are further distinguishable by the filter elements being conical and arranged in pairs where the filter elements of each pair being diametrically opposite one another within the overall claimed combination.

Claims 14 and 22 are further distinguishable by the second housing part having a cavity with an axial extension corresponding to the overall length of each filter element and being above the filter elements. No such cavity is disclosed or rendered obvious by the Sindorf patent.

Claims 15 and 23 are further distinguishable by the fluid inlet and the backwash fluid outlet being located in a first part of the housing extending between the filtered fluid outlet and the drive. Such orientation is not disclosed or rendered obvious, particularly since the Sindorf drive is located at the top of the filter housing remote from the fluid inlet 5 and the backwash outlet 8. Thus, the Sindorf fluid inlet 5 and backwash outlet 8 are not between its outlet 6 and drive 4.

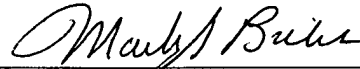
Claims 16 and 24 are further distinguishable by the filter element comprising a tubular screen filter element within the overall claimed combination.

Claim 17 is further distinguishable by the arcuate-shaped recess for the reasons discussed above relative to claim 19. Sindorf threaded bores 18 on a common circle do not provide the claimed arcuate recess.

Claims 18 and 25 are further distinguishable by the exterior surfaces of filter elements being in fluid communication to allow filtered fluid to be used as backwashing fluid. In the Sindorf device, the exterior of the filter element in the backwashing position is isolated from and is not in fluid communication with the exteriors of the other filter elements.

In view of the foregoing, claims 11-25 are allowable. Prompt and favorable action is solicited.

Respectfully submitted,

A handwritten signature in cursive script, reading "Mark S. Bicks", positioned above a horizontal line.

Mark S. Bicks
Reg. No. 28,770

Roylance, Abrams, Berdo & Goodman, LLP
1300 19th Street, NW, Suite 600
Washington, DC 20036
(202) 659-9076

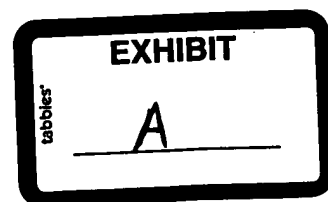
Dated: February 9, 2010

THE WAY THINGS WORK

Volume Two



SIMON AND SCHUSTER • NEW YORK



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A Division of Gulf & Western Corporation
Simon & Schuster Building
Rockefeller Center, 1230 Avenue of the Americas
New York, New York 10020
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ISBN 0-671-21086-6

Library of Congress Catalog Card Number 67-27972
Manufactured in the United States of America

8 9 10 11 12 13 14 15 16

INTRODUCTION

BY THE RIGHT HON. THE LORD RITCHIE-CALDER

*Kalinga Prize winner for promoting
the common understanding of science*

"The world will never starve for want of wonders but
only for the want of wonder..."—G. K. CHESTERTON

SO MUCH has happened since the end of World War II—the Atomic Age, the Computer Age and the Space Age, epochs concentrated into a brief lifetime—that wonder is liable to become numbed and wonders taken for granted. We flick a switch, press a button, or put a coin in the slot and expect things to happen...without asking "How?" That is sad, because as Sir Edward Appleton, the Nobel Prize-winning scientist, said, "It is such fun finding out."

And we cannot all be like my Arctic guide, Luke the Inquisitive Eskimo, who had a direct way of finding out. If he wanted to know how something worked—a wristwatch, for instance—he would just take it to pieces and memorize the mechanism. I found this childlike curiosity amusing until, when we were holed up in an igloo by a blizzard, I woke up one morning to find him dismantling my tape recorder.

Or one can do what I have done most of my life as a science writer: go to the chap who discovered something and ask him, "How does it work?" That is how, over the years, I learned about a lot of things in this book.

In going through the first volume of *The Way Things Work*, however, I was pleased (and sometimes professionally mortified) to find explanations of things which had slipped into the commonplace of my experience and about which I had never asked "How?" I was given one of the first practical ball-point pens in 1938 but forgot—all this time—to ask just exactly how it worked. It is simple, like most good ideas. For years I have been using a Polaroid camera. To photograph and develop immediately is like practicing a conjuring trick; it fascinates children and grownups alike; and sometimes it spoils the relish of a trick when one knows exactly how it is done. So I went on conjuring without asking! Now I know that the "How" is just as fascinating as the "Hey presto!"

Away back in 140 A.D., Hero of Alexandria invented the first coin-in-slot vending machine for dispensing holy water. It is interesting to have

Clutches (continued)

An *automatic clutch* is often installed between the driving shaft of a motor and the machinery it drives. It enables the shaft to reach a predetermined speed before engagement is effected and is especially useful in a case where the driven machinery requires a high starting torque. For such purposes a centrifugal clutch (Fig. 1) may suitably be employed. It comprises two or more "shoes" which, when the driving shaft on which they are mounted has reached a certain speed, overcome the pressure of restraining springs by the action of centrifugal force and move outwards to press against the inner surface of the rim mounted on the driven shaft. In this way the transmission of power to the driven shaft is gradually and automatically increased, so that smooth engagement is effected. The speed at which engagement takes place can be increased by fitting the clutch with more power-restraining springs, and vice versa. When the shafts are not rotating, the shoes are retracted and not in contact with the rim. Various other types of automatic clutch are likewise based on the centrifugal principle.

Freewheeling clutches drive in one direction only and permit free movement when the speed of the driven shaft exceeds that of the driving shaft. In the grip-roller type of freewheeling clutch (Fig. 2) each roller is gripped, i.e., jammed, in the wedge-shaped space as soon as the movement of the outer race in relation to the inner race causes the roller to move into the "shallower" part of this space. With clockwise rotation this occurs when the outer race tends to overtake the inner race; the two shafts then become locked together: i.e., the clutch is now engaged. When the outer race slows down and tends to lag behind the inner, the roller moves into the "deeper" part of the space in which it is housed. This disengages the clutch. In the slip clutch (Fig. 3), springs produce the contact pressure between the two clutch bosses and the interposed (longitudinally movable) friction plate provided with friction linings on both its faces. The friction developed at these faces will depend on the contact pressure exerted by the springs. If the pressure is low, the friction will also be low, so that slip in the clutch will occur at a low value of the torque. By means of a screw it is possible to increase the spring pressure and therefore the friction, so that the clutch will be able to transmit a greater torque without slipping. The torque can thus be adjusted to a predetermined value, and the clutch can serve as a safety device against overloading of the driven machinery. A simpler safety device for this purpose is the shear-bolt coupling (Fig. 4). It comprises two flanges connected by bolts that are designed to fail in shear (i.e., to "break off") when the torque exceeds a predetermined value.

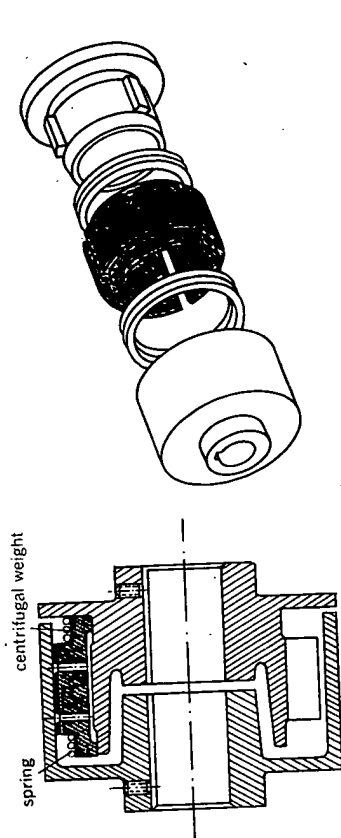
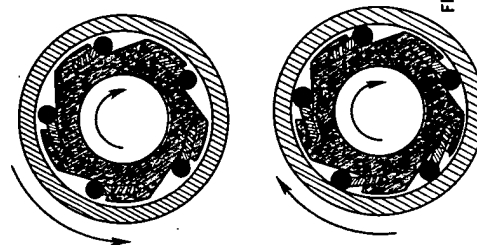


FIG. 1 CENTRIFUGAL CLUTCH



	when rotated clockwise	counterclockwise
clutch is engaged	when outer race tends to overtake inner race	when inner race tends to overtake outer race
clutch is disengaged	when inner race overtakes outer race	when outer race overtakes inner race

FIG. 2 GRIP-ROLLER FREEWHEELING CLUTCH

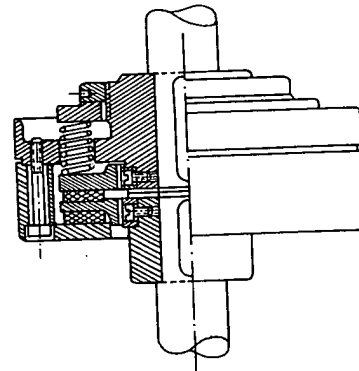


FIG. 3 SLIP CLUTCH

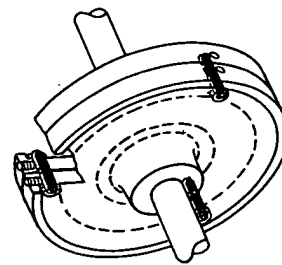


FIG. 4 SHEAR-BOLT COUPLING

United States Patent and Trademark Office

An Agency of the Department of Commerce

Closing of the United States Patent and Trademark Office on Monday, February 8, 2010 through Thursday, February 11, 2010

In view of the official closing of the Federal government offices in the Washington, D.C. metropolitan area, including the United States Patent and Trademark Office (USPTO), from Monday, February 8, 2010 through Thursday, February 11, 2010, the USPTO will consider each day from Monday, February 8, 2010 through Thursday, February 11, 2010, to be a "Federal holiday within the District of Columbia" under 35 U.S.C. § 21(b) and 37 C.F.R. §§ 1.6, 1.7, 1.9, 2.2(d), 2.195 and 2.196. Any action or fee due from Monday, February 8, 2010 through Thursday, February 11, 2010 (or the preceding Saturday (February 6, 2010) or Sunday (February 7, 2010)) will be considered as timely for the purposes of, e.g., 15 U.S.C. §§ 1051(b), 1058, 1059, 1062 (b), 1063, 1064, 1126(d), or 35 U.S.C. §§ 119, 120, 133 and 151, if the action is taken, or the fee paid, on the next succeeding business day on which the USPTO is open. 37 C.F.R. §§ 1.7(a) and 2.196.

37 C.F.R. §§ 1.6(a)(2), 2.195(a)(4) and 2.198 provide that correspondence deposited in the Express Mail Service of the United States Postal Service (USPS) in accordance with

37 C.F.R. §§ 1.10 or 2.198 will be considered filed on the date of deposit (as shown by the "date-in" on the Express Mail mailing label) with the USPS. Thus, any paper or fee properly deposited in the Express Mail Service of the USPS from Monday, February 8, 2010 through Thursday, February 11, 2010, in accordance with 37 C.F.R. §§ 1.10 or 2.198 will be considered filed on its respective date of deposit in the Express Mail Service of the USPS (as shown by a "date-in" of February 8, 2010, February 9, 2010, February 10, 2010, or February 11, 2010, on the Express Mail mailing label).

37 C.F.R. § 1.6(a)(4) and 37 C.F.R. § 2.195(a)(2) provide that patent and trademark-related correspondence transmitted electronically to the USPTO will be considered filed in the USPTO on the date the USPTO received the electronic transmission. Thus, any patent and/or trademark-related correspondence transmitted electronically to the USPTO will be considered filed in the USPTO on the date the USPTO received the complete electronic transmission, even if the USPTO is closed on that day. Correspondence successfully received by the USPTO through the patent Electronic Filing System (EFS-Web) will receive the date as indicated on the Acknowledgement Receipt. Trademark Electronic Application System (TEAS) filings will receive the date indicated in the e-mail confirmation sent at the time of a successful filing.

Previous Legal Notifications Related to Security Issues and Emergencies

- [Closing of the United States Patent and Trademark Office on Monday, December 21, 2009 \(24 Dec2009\) \[PDF\]](#)
- [Closing of the United States Patent and Trademark Office on Friday, December 26, 2008 \[signed 22 December 2008\] \(23Dec2008\) \[PDF\]](#)

The United States Patent and Trademark Office (USPTO) will be closed on Friday, December 26, 2008. Since Thursday, December 25, 2008, is a Federal holiday, the USPTO will consider both Thursday, December 25, 2008, and Friday, December 26, 2008, to be a "Federal holiday within the District of Columbia" under 35 U.S.C. § 21(b) and 37 C.F.R. §§ 1.6, 1.7, 1.9, 2.2(d), 2.195 and 2.196. [READ FULL NOTICE>>>](#)

- [United States Postal Service Interruption and Emergency under 35 U.S.C. 21\(a\) \[signed 18 September 2008\] \(29Sep2008\) \[PDF\]](#)

The United States Patent and Trademark Office (USPTO) is designating the interruption in service of the United States Postal Service (USPS) in the areas affected by Hurricane Gustav in Louisiana and Texas beginning on